

# Li-Ion & LiPo Battery Storage Recommendations

While advice may vary slightly from one cell manufacturer to the next, we are all generally on the same page when it comes to storage and maintenance requirements. Please review the information below for our best advice for maintaining your batteries.

## TEMPERATURE & HUMIDITY CONTROL

To avoid accelerated battery self-discharge during periods of storage, it is recommended that long-term storage locations are kept between the temperature range of 5–40°C, with optimal storage between 20–30°C. The lower the temperature in this range, the better.

Relative humidity is another factor if high. The recommended level is 30 percent. **Do not store the battery in a hot vehicle.**

## SHELF LIFE

Even with the proper care, Li-Ion and LiPo batteries have varying shelf lives. For a lithium battery, a typical self-discharge rate is 1.5 percent per month. If the batteries are initially charged to 50 percent before storage, they should be fine for an additional year before being recharged. This period is determined by the quality of cells, in particular the rate of electrolyte leakage through their case. After 5 years, the battery chemistry can become unstable and use beyond this range is not recommended.

## CHARGE LEVEL

Li-Ion and LiPo batteries that are shipped by air or ocean cannot be charged above 30 percent of rated capacity. Therefore, new batteries put into storage immediately upon being received will be at or below 30 percent. We recommend storing Li-Ion and LiPo batteries at 40–50 percent rated capacity.

## CAPACITY RECOVERY

After extended periods of storage, significant capacity loss may occur, so recharging is required. However, there are two kinds of capacity losses to consider for optimal battery maintenance.

### SELF-DISCHARGE

The rate of self-discharge for Li-Ion and LiPo batteries can vary between 1-2 percent per month, with a 5 percent rate within the first 24 hours. Smart packs will have a higher rate of self-discharge if not stored in a “sleep” mode, approximately 5 percent per month. Normal charging recovers all this loss.

### CHEMICAL DEACTIVATION

Li-Ion and LiPo batteries should never be depleted to below their minimum voltage, 2 V per cell, for any extensive period. Copper shunts form inside the cells which can cause increased self-discharge, or a partial electrical shortage, and capacity is lost.

Cells that are deeply discharged require special care during recharge. Recharging deeply discharged packs require chargers that support a “deep discharge mode.” All Power Products chargers have this feature, but many chargers do not. To prevent the packs from becoming deeply discharged, it’s recommended that batteries are charged at least once every 6-12 months during long term storage.

Sandown Wireless  
www.criticalbattery.com  
603-425-9876 sales@criticalbattery.com